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AUTHOR Blanzy, James J.; Sucher, Joseph E.
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ABSTRACT

Michigan's Macomb Community College's institutional assessment model involves using technology to collect and disseminate data on student learning in order to facilitate continuous improvement and adaptation. The first element of this five-part model is the mandatory testing, orientation, and placement of incoming students. Using placement test scores, course grades, and placement recommendations, computer programs analyze the comparative success and retention rates of students who do and do not follow placement recommendations. Success rates, retention, and completion rates have all improved for those who do. The second part of the model relates student learning outcomes to course objectives. A computerized "Early Warning System" uses faculty input to identify students at risk of failure during the first weeks of each semester, and passes on suggestions for improved attendance or additional counseling. Student perceptions of faculty and course effectiveness are also analyzed. The third element is long-term monitoring. Each student's program is regularly analyzed and updated by the computer, not only in terms of progress toward a degree, but also with regard to fulfilling transfer requirements. The fourth element is exit competency assessment, using pre- and post-tests to measure student gains after 2 years. A review of degree requirements is underway which emphasizes student learning rather than course requirements. The fifth element of data collection focuses on transfer and employment. Former students, current staff, area employers, and senior colleges and universities are surveyed to inform the development of strategies for meeting the needs of future students. (JSP)

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Jacksonville, Florida January 27, 1992

By: James J. Blanzy
Provost and Senior Vice President for Academic Affairs
and
Joseph E. Sucher
Director, Information and Planning Systems

Macomb Community College
Warren, Michigan 48903

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Technology: The Silent Partner in the Advancement of Measurement and Assessment Practices (A Student Centered Assessment Model)
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James J. Blanzy, Provost and Senior Vice President for Academic Affairs
Joseph E. Sucher, Director, Information and Planning Systems
Macomb Community College
14500 Twelve Mile Rd.
Warren, Michigan 48093

OVERVIEW: The foundation for an institutional assessment model at Macomb Community College consists of continuous improvement and adaptation based upon the collection and dissemination of data with the assistance of technology. The centerpiece of the assessment model at the College corresponds to the foundation of the community college mission - student learning.

Colleges exist to enhance the students ability to learn, not just to supply technical knowledge. It is assumed that educational institutions provide to students the ability to deal with abstract ideas through words, numbers and symbols. With the ability to deal with abstract ideas, members of learning communities will be better able to understand and control their environment. The task higher education faces is difficult and complex, but our focus is simple - our focus is, as Pat Cross would say, teaching for learning. These fundamental assumptions were used to create a model for assessment that focuses on student ability, student learning and perceptions of college services.

Five areas of emphasis will be discussed: 1) testing, placement, and orientation and goal selection, 2) student outcomes as course goals, 3) long term monitoring of student progress, 4) assessment of student learning related to certificate and degree outcomes, and 5) focus on purpose through follow-up measures. Each of these areas will be considered from a practioners point of view. That is, each area of emphasis will include information on the philosophical basis for including the area in the assessment model, processes and practices used in data collection, course design and delivery, program and degree design, and modification of academic or student services.

ASSUMPTIONS: The five-part model is based upon six fundamental assumptions.

1. The object of teaching is for students to learn. Many authorities have identified the gatekeeper function of community colleges. That is, that the role of community colleges is to keep the unqualified from attending real colleges - give unqualified students a chance, but flunk them out. That in giving these students a chance, community colleges serve a safety valve role for society. This concept is rejected. The role of community colleges is to teach students how to learn, how to use ideas and principles to better

understand their world, and to continue to grow in their ability to learn. College resources are to be used to cause learning to occur and to measure what students have learned.

2. Assessment of student learning as opposed to testing is formative in nature. The process of teaching and learning is fluid. It requires educators to receive information from students on an ongoing basis. Only when this occurs is there time to adjust and make modifications in the processes used with classes or colleges. By collecting information in a systematic manner, college staffs can engage in what Pat Cross and Tom Angelo call Classroom Research. Research conducted by the teacher to improve learning through improving teaching.

3. The purpose of classroom assessment is to determine how students are progressing and to adjust the treatments being used with students to improve their learning. It is based on the belief that the sooner a problem is detected, the easier it is to correct.

4. Prerequisites are higher education's form of "materials" control. They are an assurance that students have the basic intellectual abilities to succeed in the course. Unlike senior colleges and universities, most community colleges do not have admission standards. Typically, community colleges typically only establish prerequisites for sequence courses. Community colleges have a weak or non-existent "materials" control program. Prerequisites, or material control, are not established as artificial barriers, but rather as a technique to meet a fundamental purpose of higher education. Prerequisites allow for a coherent curriculum design that allows for progressive depth as well as breath.

5. Basic learning skill competencies should be established for admission to degree programs. It is unrealistic to think that a community college can have the resources to take any student regardless of their competency and help them be successful.

6. Accreditation not only provides students with an enhanced capability to transfer, it also provides assurance to the community that community colleges are meeting standards that are appropriate to an institution of higher education. All of the regional accrediting associations and many of the professional societies have placed new emphasis on student learning outcomes and on each institution's ability to measure the impact it has on student learning. For educational institutions that focus on student learning, this requirement is easy to embrace.

ENTRANCE TO COLLEGE AND COURSES - TESTING, ORIENTATION, PLACEMENT:

Testing, orientation and placement are often a college's first - and possibly most important - personal contact with new students. With the increasingly diverse needs of students arriving on the campuses of community colleges, it is more important than ever to assist students in determining their educational goals, helping them to assess their educational strengths and weaknesses, and to develop with them a realistic instructional program designed to provide experiences and opportunities to maximize their chances of success.

Macomb Community College's testing, orientation and placement programs are designed to do this. However, these services present us with overwhelming amounts of data to be collected, processed, analyzed and stored for later use. To cope, the college depends heavily on the advantages of technology based solutions.

The testing process is almost continuous year around with very heavy testing occurring during the summer months. ACT's ASSET test (Form b) is used to assess the basic skills and algebra competencies of most new students. Tests are administered to students at two of our three campuses and sometimes at the site of a local business. Tests are scored at the test sites using a NCS scanner attached to a PC. Then the answer sheets along with the educational planning forms are scanned and the results stored on microcomputer disks. Each night, the data is uploaded from the micro disks to the mainframe system where the permanent student records are maintained.

Outputs from the scanning processes are produced by both the micro and mainframe systems. Student reports containing scores on the subtests, and the English, math and reading course recommendations based on test scores, are generated on the micro systems at the test sites. Based upon student furnished information, the Counseling Departments and the Learning Centers receive lists of students who have physical impairments, who use English as their second language or who are learning disabled, or of those requesting extra or remedial assistance.

After the start of each semester, additional reports are prepared for use by researchers both at the college and at the local school districts. From the mainframe records, graphical reports of student performance on the ASSET test are produced for each high school, so high school officials can to compare their students' scores to the average of all students coming to MCC. Using SAS and SPSS, ASSET scores are correlated to class grades to monitor the relationship between initial assessment scores, placement and performance in classes as measured by course grades. This data is used by those interested in monitoring the reliability of the cutoff scores used in making placement recommendations.

Using ASSET scores, course grades and placement recommendations, SAS programs running on the mainframe analyze the success and retention rates of those students choosing to follow the placement recommendations and the rates of those students ignoring the placement recommendations. This information is then used to counsel future students.

When Macomb initiated this mandatory program, concern was voiced about the impact on students, their success and upon enrollments. The increased success of our students in courses in which they were placed as a result of our student success program has been documented. Increased success rates of 6% to 8% have been achieved. Retention and completion rates have improved since the inception of the program.

Three points related to retention and completion should be noted. 1) The average number of credit hours per student has increased since mandatory orientation has been instituted as part of Macomb's Student Success Services program. 2) The number of students who return from the spring term to the fall term has increased, and 3) the number of degrees awarded has increased. This data does not conclusively prove that the improvements can be attributed to Student Success Services, but it certainly is reassuring there has not been a downward trend in these areas. In addition, the initial concerns that students would not enroll if mandatory testing and orientation were implemented have been dismissed by the facts.

The elimination of a late registration period initially had a negative impact on enrollment. That, however, was anticipated but judged to be worth the impact in order to assure that students who began the class would have the maximum opportunity to succeed. The elimination of late registration was also intended to provide the teaching faculty with the opportunity to start classes the first night and expect their students to be ready. In addition, book store hours were extended so that classes would not have to be dismissed early for students to obtain their texts.

Several other issues have been brought to the College's attention as a result of the basic skills testing, orientation and placement program: Should the College develop a vestibule program for students who are deficient in all or some basic skills areas? Should all degree programs require a certain level of competency? And, most importantly, should an attempt be made to remediate all basic skill deficiencies irregardless of how severe?

A middle ground position - namely that remedial courses begin no lower than the seventh grade level - is currently being considered at the College. Dennis Thompson, Macomb's Director of Project Cooperation with ACT, has identified through his research that students in the lowest level remedial courses make progress, but frequently they do not make sufficient progress to be successful in the next course in the sequence. Consequently, this brings up questions such as "Do we determine a minimum skill level where we start, so students can be successful?" or "Do we create an instructional design that allows for the large variance in skill levels and provides individualized instructional treatment for each student, so we create open entry/ open exit courses that respond to student time needs and instructors from other areas who find basic skill deficiencies in their students?" These are difficult but necessary questions to answer if colleges are serious about student learning and student success.

STUDENT OUTCOMES AS COURSE GOALS: The second part of the assessment model relates student learning outcomes with course objectives. The next level of support a student may experience as part of our student success emphasis is the Early Warning System. Just as it is important to get a student off to a good start when entering college for the first time, Macomb Community College believes it is important that students get off to a good start in each and every one of their classes each semester. If there is a problem, it is best detected and dealt with as early in the semester as possible. Early detection and intervention is the purpose of the early warning system and the goal is successful completion of the class.

During the second week of each semester, from the student record system on the mainframe, optically scannable class rosters are printed and distributed to each member of the teaching faculty. By approximately the fourth week of the semester, faculty have completed an initial assessment of their students, identifying those having problems which may prevent successful completion of the course. On the roster form, the faculty member indicates which students are having a problem, and the source, such as an academic problem or an attendance problem. Optionally, the faculty member may suggest a preferred outcome such as a visit to a counselor, or additional support from the Learning Center. At a minimum, the student will be

sent a letter from the College suggesting that corrective action is indicated, and the College stands ready to support the student in any way that it can. The completed rosters are returned to the Data Center where they are scanned and the data is posted to the mainframe files. From the information collected, individual student letters are machine generated and mailed. Lists are also prepared for the Counseling Department and the Learning Centers of those students for which faculty requested specific assistance.

At the end of several semesters, the grades of students identified by faculty as having problems were analyzed. We have found that faculty, even by the fourth or fifth week of a semester, are able to identify those students in academic trouble. Our research shows that students identified as having problems succeed in that class only 34% of the time and students identified as not having problems succeed 84% of the time. These results have been replicated in two successive studies.

A part of our course outcomes assessment is the collection of student perceptions of the quality of courses and the quality of the instruction given. Not all faculty are evaluated in all of their classes, but each Fall semester approximately 14,000 student evaluations of full-time faculty are processed and in the Spring another 10,000 student evaluations of part-time faculty are received for processing. The College does more than print out the individual faculty summaries for distribution and filing. Computer programs have been written to select the responses to nine key indicators and summarize performance at the faculty, department, division and campus level. Summary results are compared across years and the data shared with faculty and staff.

Good trends are highlighted, and bad trends are spotted for attention. This data is later added to that already collected and loaded to files that are remotely accessed via terminal or mainframe connected PC. Like many of the processes mentioned earlier, the information is gathered and analyzed in an effort to continuously monitor and improve the quality of our instruction.

There are two points that deserve some emphasis related to early monitoring and end of class evaluation of student outcomes. Lack of quality control within education has received criticism when compared to the automotive industry. One of the items mentioned in favor of the auto industry is the fairly recent change that gives authority to the production worker to collect quality related data and stop the production line. Think of the authority and responsibility our faculty members have in the classroom. They can stop production if students are not learning what they should: they can change the treatment given to the students by changing the form of instruction; they can assess through questions, discussions, written statements and other means student progress; and they can call in teams of people including counselors and learning center staff, to assist in correcting deficiencies student learning. They have tremendous control and a good number of resources to bring to bear to assist students in meeting their objectives. One of our challenges as an administration at Macomb Community College is to help provide the resources.

The other item that each department, rather than each individual teacher, should consider relates to the measurement of student learning. A course is submitted and approved with a discipline

prefix, such as an accounting course or a psychology course. It is not an individual's course. There is a right and a responsibility to develop the learning outcomes in common. Common assessment might result in a common assignment or exercise for some outcomes or it might result in a common final exam. Russ Edgerton of AAHE refers to the 3 P's of assessment - performance appraisals, projects and portfolios. For the same course taught by more than one instructor, instructors at Macomb are just beginning to come to grips with how the department certifies that students have met the learning outcomes identified for the course.

LONG TERM MONITORING: To measure a student's progress toward his or her stated goals, every semester each student's records are analyzed in the context of the program that the student has on record, and a report of the progress is sent to the student's home. This monitoring process is called CPAS, Computerized Program Advising System, When a student changes programs, the system brings into his or her record the most current catalogue information. From that point on, progress is measured using the updated program information as the base. A massive effort was launched several years ago to key into the mainframe the course requirements of all programs and all transfer programs agreed to between MCC and the various colleges and universities. When a student comes in for a counseling appointment, a counselor often asks for the student's CPAS or sits down at a CRT to review the student's progress on-line. The benefit of this system is that it keeps the student focused on his or her stated goals and the ability to update the student with the newest information available. Also each semester, the Counseling Department may have the transcripts of all current students analyzed for what we have determined to be the minimum acceptable performance levels. Within a couple of hours, the computer can evaluate the transcripts of 30,000 students, and prepare lists of those failing to measure up to the minimum performance levels that have been established. Without the processes to collect and store the right data and without that data being computer assessable, the analysis of 30,000 student transcripts becomes a formidable task.

Our next step on long-term monitoring began this spring semester. Our academic standards committee is considering an academic probation policy. The intention of such a policy is not to bar students from enrolling at the College, but rather to provide them with guidance in order to enhance their opportunities for success. Such a policy will probably be aimed at students who have completed 16 or more hours with less than a 2 point GPA or who have not completed one-half of the courses they have attempted at the College.

EXIT COMPETENCY ASSESSMENT: All of the efforts at Macomb Community College, all of the systems, and all of the computing resources are without value if in the end, students aren't learning. Several years ago, Macomb joined with other community colleges and with ACT to pilot an assessment instrument that is designed to measure gains in students' knowledge. Our research was designed to determine the efficacy of using the ASSET as a pre-test and the CAAP as a post-test to measure student gains after a two-year college experience. Macomb also wanted to use the project to assess the impact of our

developmental courses on preparing a student for college level work. The Fall 90 cohort of students took the ASSET test and one module of the CAAP test, with the results being stored on the mainframe in their permanent student record. This Spring the computer will search the records for the students that were pre-tested with CAAP 18 months ago. Once identified, the students will be sent invitations to participate in the post-test scheduled for the end of the term. The tests will be scanned and the results posted to the mainframe files, and additional programs will be written to extract the data needed to analyze the gains in knowledge experienced by these students after two years at Macomb.

Two years ago, the process of reviewing degree requirements began. Collectively, the professional staff of the college determined to take an outcomes approach - an approach that first specifies what students are to learn, not what courses they are to take. That step will be completed early this Spring, and during the spring term we will design our degree requirements in a manner that will allow students to reach those outcomes. In this way, we have a chance of designing a coherent curriculum, not a smorgasbord. Jacques Barzun puts it in much blunter terms. He says that "... one must hope that in time the academy's self disgust will help ... reduce to some rational form the instructional supermarket of our day." (Barzun, Begin Here, The Forgotten Conditions of Teaching and Learning, The University of Chicago Press, 1991. p.196) Colleges have an opportunity to move toward this ideal, if they keep students, learning and professional ethics clearly in view. A clear statement of degree outcomes is one additional significant piece that will allow colleges to continually improve - improve it for the purposes it was created: TO HELP STUDENTS LEARN.

The foundation for student learning is a coherent curriculum and design, a coherent degree requirement design, based upon principles and not self-interest. After these outcomes are finalized, the College still must collectively determine how to measure and when to assess student achievement of these outcomes. In addition, the college will have to create a process that will provide this information to the college and the student. This information will be a key indicator of how well we are meeting our purpose as an institution of higher education - our purpose of helping students learn. This data can then be used to impact and improve our courses and programs. It can and will be the basis for continual improvement. It will mark a significant increment in our focus on students and the development of their talents. At Macomb, this is the basic direction in which we have moved and will continue to move in the future.

FOLLOW-UP MEASURES: The last area of data collection focuses on the manifest purposes of why students seek degrees from Macomb Community College - transfer and employment. Survey data is collected and entered into computers for the purpose of relating the results of one survey to previous surveys. Current students, former students (graduates, transfers, drop-outs), current staff, area employers, advisory committee members, and senior colleges and universities are all being asked to provide Macomb with information in a format that is usable. We have begun experimenting with trend analysis and other sophisticated statistical procedures in an effort to craft strategies to deal with the needs of future incoming students.

Most of the indicators point to the fact that Macomb is a quality educational institution that is continually improving. Our transfer success is very high compared to other community colleges and native senior college students. Employers find students to be well-prepared for their jobs, and students are greatly satisfied with the services they receive. Evaluations of occupational programs and the liberal arts disciplines indicate the programs are meeting their purposes. Internal evaluations have been validated by external sources. The College is on a course of continuous improvement because of the collective efforts of the staff and its use of the data collected. Concern for student learning and for quality are not black and white issues. These concerns are not always easy to keep in front of us.

The most important thread running through all of our efforts at Macomb Community College is the desire to help students succeed. An enabling structure common to all our efforts is the heavy use of technology.

FUTURE: Last Fall the college agreed to be a beta test site for ACT's new computer adaptive test modules for numerical skills and algebra. The College, before deciding on a particular package, will review all available software. However, given the speed of computers and the desire of students to get the most information possible with the minimum investment of time, computer adaptive testing seems to be an appropriate direction. Far more diagnostic work can be done, and a much finer definition of deficiencies can be made, resulting in better placement recommendations for students.

The directions we need to pursue are clear and well-documented. At Macomb we feel we are on the right track with the work we are doing with course, program and degree outcomes. We know that we have much more to do with assessment and that the process will never end. There will always be room to improve in helping students to learn.

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